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Science"; and to students of society by several publications on heredity and eugenics. In other words, they have proven their right to the present undertaking by substantial contributions to at least two distinct fields of research.

It is obvious, of course, that a field so vast can not be covered satisfactorily in a single volume of moderate size. Accepting this limitation as inevitable, and setting aside criticisms which, unmindful of it, one might pass readily, it may be said at once that the effort is remarkably successful. Indeed, I am unacquainted with a better book, particularly in the matter of unexpected suggestiveness (towards the close notably), of equal or briefer compass. I would commend the spirited, sometimes eloquent picture of the medieval mind (pp. 64 f.), the lucid account of Newton (pp. 128 f.), the absorbing tale of the rise of electrical science (pp. 181 f.), the generous tribute to Darwin (pp. 209 f.), and the last chapter (pp. 233 f.), which is, in itself, enough to justify the book. It is a pleasure to meet devotees of "natural knowledge" who not only can write, but evince sane appreciation of humanistic knowledge.

The blots are few. Here and there, especially in the Introduction and on the last page, the authors permit themselves to be betrayed into what I take the liberty to call silly remarks about philosophy and metaphysics. Plainly, their *Wissenschaft* knows not these subjects as *Wissenschaft*. This is the more striking that, in other contexts, they make most ample amends. I mention this, because it punctuates the contrast between themselves and Dr. Th. Merz, with whom they are likely to be compared. They may feel his catholicity, they do not always observe it.

The race-theory, a result of their sociological inquiries, which Mr. and Mrs. Whetham apply to their subject, is one of the fascinating features of the book. "Natural knowledge" has been formulated and developed by the races of northwestern Europe. "It is possible that danger to science, as to society, lies ahead. . . . The dominance of the universal proletariat, which some dread and others ac-

claim—a proletariat not dissimilar in race to the southern rulers of the Roman Church—may threaten in the future the freedom of enquiry, the fearless exercise of reason, the full development of personality, that form the life-blood of the northern race and its scientific achievement. . . . If the same race once more gains ascendancy in northern lands, as, by the differential birth-rate and the downward shift of political power, it seems destined to do, it is difficult to believe that scientific results which threaten its prejudices or are not in accord with its ideals will be respected" (pp. 279–80). Darwin was a conspicuous product of the Anglo-Danish and East Anglian folk, who have done most for the progress of science. And so, Mr. Whetham is able to construct a great brief for his own, the East Anglian, university. Nevertheless, I do not see why he should have omitted Macquorn Rankine in reference to the foundation of thermodynamics (p. 179). Nor does his theory, of the mysticism of the northern race, supply the reason why Kelvin "is said to have begun his lectures on physics with the Collect for the day" (p. 158). As a pupil, I may say that Kelvin did so, but because it was the universal custom at Glasgow to open the morning classes with prayer. Nevertheless, I accept the theory, as indeed I must—my paternal ancestors for generations are East Anglians! And yet, I am in doubt; for I still traffic in "speculative philosophy, tossed about by every wind of doctrine" (p. 7). But, it were too hard a test to ask an author to prove his theory on the *corpus vile* of a reviewer of whom he never heard tell. So, once more, I say the book is thoroughly worth while.

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NOTES ON ENTOMOLOGY

THE eleventh volume of the Hampson catalogue of moths has been issued by the British Museum.¹ It deals with four groups—Ente-

¹"Catalogue of the Lepidoptera Phalaenæ in the British Museum," Vol. XI., pp. 689, text figs. 175, pls. CLXXIV.–CXCI., 1912.

lianæ, Stictopterinae, Sarrothripinae, and Acontianæ, which include nearly 1,000 species arranged in about 150 genera. They are mostly from tropical countries.

ONE of the most interesting series of books is that on the fauna of India. A recent volume by Canon Fowler on the beetles is especially attractive because of the general account of the Coleoptera.² There is a discussion of the several recent classifications of Coleoptera, the author using, although hardly accepting, three principal divisions, Adephaga, Polyserata and Lamellicornia. The essential characters are given for each family, 103 of which are recognized by Fowler, and a short account of their habits, larvæ, distribution and peculiar forms. A glossary of technical terms used in Coleoptera is also included. In the main part of the work the Indian tiger beetles are fully described and many illustrated in text figures. The part on the Pausidæ includes a summary of their habits, and the little known about their larvæ. The Rhysodidæ and Cupedidæ are also treated in this volume, each with only a few species.

OF all the peculiar termitophilous insects the Histerid beetle recently described by Dr. E. Mjöberg will easily rank as the most remarkable.³ It is a native, of course, of Australia. There are two tufts or pencils of long, curved hairs arising from each side of the base of the elytra. The termites gather a secretion from these hairs, but it is not known whether the secretion comes from the hairs. The insect is named *Eucurtia paradoxa*.

THE value of minute structures in classification is well illustrated by an article on the classification of the bed bugs by Dr. K. Jordan and N. C. Rothschild.⁴ They divide the

family into three subfamilies on the nature of certain bristles, whether serrate on certain portions or not. The Clinocorinae includes *Clinocoris* and *Æciacus*; the Cacodminæ includes *Cacodmus*, *Loxaspis* and *Aphrania*, and the Hæmatosiphoninae the one genus *Hæmatosiphon*.

THE life habits of structurally peculiar insects are apt to be unusual, and Dr. F. Germer has found this true of the Lymexylonidæ.⁵ The adult does not feed, but the larvæ apparently feed on a fungus that grows in their burrows. The author illustrates the peculiar structures of antennæ and palpi in various sensory functions.

DR. A. DÜCKE has published a revision of the South American genera of bees.⁶ He gives a bibliography of South American bees since Dalla Torre's catalogue, a synopsis of the sixty-eight genera known from the region, the geographical distribution of each genus, in some cases a list of the described species, and descriptions of a few new forms.

PROFESSOR T. MIYAKE has given the most complete account, so far, of the life history of a Panorpid.⁷ The eggs are deposited in clusters of from six to ten in crevices in the soil. The larva of the Japanese species is similar to that of the European and American species already figured. They probably pass through seven molts, the perforations in the spiracles increasing in number with each molt. The larvæ feed on dead insects. There are two broods in a year. The adults were observed to feed on dead insects and the petals of a flower. None have been observed catching living insects.

DRS. J. SCHNABEL and H. Dziedzicki have produced a most important work on the

² "The Fauna of British India, including Ceylon and Burma," Coleoptera, I., General Introduction, Cicindelidæ and Pausidæ, 529 pp., 240 figs., London, 1912.

³ "On a New Termitophilous Genus of the Family Histeridæ," *Ent. Tidskrift*, 1912, p. 121-124, 1 plate.

⁴ "Notes on the Clinocoridæ, a Family of Rhynchota, with Descriptions of a New Genus and Species," *Novit. Zool.*, 1912, p. 352-356.

⁵ "Untersuchungen über die Bau und Lebensweise der Lymexyloniden," *Zeitschr. wiss. zool.* (1), Bd. 101 (1912), pp. 683-785, 2 pls., 31 text figs.

⁶ "Die natürlichen Bienengattungen Südamerikas," *Zool. Jahrb., Abt. Syst.* XXXIV., p. 51-116, 1912.

⁷ "The Life History of *Panorpa klugi* McLachlan," *Journ. Coll. Agric. Imp. Univ. Tokyo*, IV., No. 2, pp. 117-139, 2 pls., 1912.

Anthomyidæ.⁸ It is a critical revision of the genera of the family, with especial consideration of the male genital apparatus, and all the plates represent hypopygia or lobes of the fifth ventral segment. The authors consider the family in the sense of Girschner, including most of the Muscidæ. In the supplementary part are descriptions of many new species, mostly from Russia.

THE progress of entomology in South America is unfortunately slow, and for this reason we welcome each new elementary treatise from that quarter as an encouragement for the local naturalists to collect and study their insects. A new work of this character is by Dr. C. E. Porter on the Myriopods of Chili.⁹ He gives an illustrated account of the structure and habits of myriopods, and follows with an annotated list of the 64 species so far described from Chili. Many of the genera are different from those of our country, and several are peculiar to Chili.

THE anatomical part of the 34th (1912) volume of the *Zoologisches Jahrbücher* is more than ordinarily occupied by entomological articles. Mr. Edw. Schoenemund gives a descriptive and biological study of the larvæ of the three large European Perlas,¹⁰ with notes on the anatomy of the respiratory and digestive systems, and the development of the sexual organs.

Mr. S. Surlov has an article on the salivary glands in the head of some Orthoptera, especially *Mantis*¹¹ and their relation to similar glands in Myriapoda.

Dr. H. Mammen gives a comprehensive study of the comparative morphology of the stigma in various Hemiptera,¹² both in

⁸"Die Anthomyiden," *Abh. Kaiserl. Leop.-Carol., Deutsch. Akad. Naturf.*, XCV. (No. 2), pp. 55-358, 35 pls., 1912.

⁹"Introduccion al estudio de los Miraopodos," Santiago, 1911, 68 pp.

¹⁰"Zur Biologie und Morphologie einiger Perla-Arten," pp. 1-56, 2 pls.

¹¹"Über die Kopfdrüsen einiger niederen Orthopteren," pp. 97-120, 3 pls.

¹²"Ueber die Morphologie der Heteropteren und Homopteren-stigmen," pp. 121-178, 3 pls.

Heteroptera and Homoptera. He finds that in most Hemiptera there is but one muscle to each stigma whose contraction closes the slit, but in a few forms, two or three muscles occur.

Dr. W. Baunacke has a long article on the sense organs of certain aquatic Hemiptera of the family Nepidæ.¹³ These organs on the venter are considered to be organs of orientation.

Mr. E. Foerster gives the results of a study of the comparative anatomy of the sting of various ants,¹⁴ and traces the homologies.

NATHAN BANKS

SPECIAL ARTICLES

PALMESTHETIC BEATS AND DIFFERENCE TONES¹

IN publishing the results of my experiments on palmesthetic difference sensibility,² I did not take up the question whether the discriminations with which we were dealing were of rates of succession of discrete sensations, or of differences in the characters or quasi-characters of continuous sensations. That this question must be raised is of course obvious, since the vibration-rates of the forks I employed (between four and five hundred vibrations per second), are below the fusion limit as reported by Valentin,³ von Wittich,⁴ Schwaner⁵ and others. The results of Preyer,⁶

¹³"Statische Sinnesorgane bei den Nepiden," pp. 179-346, 4 pls.

¹⁴"Vergleichend-anatomische Untersuchungen über den Stechapparat der Ameisen," pp. 347-380, 2 pls.

¹From the Psychological Laboratory of the Johns Hopkins University.

²Dunlap, K., "Palmesthetic Difference Sensibility for Rate," *Amer. Jour. of Physiol.*, XXIX., 108-114.

³Valentin, "Ueber die Dauer die Tasterindrücke," *Arch. f. Physiol. Heilk.*, XI., 438.

⁴Von Wittich, "Bemerkungen zu Preyer's Abhandlung über die grenzen des Empfindungsvermögens und Willens," *Pflüger's Archiv*, II., 329.

⁵Schwaner, "Die Prüfung der Hautsensibilität mittelst Stimgabeln bei gesunden und Kranken," *Inaug. Diss.*, Marburg, 1890.

⁶Preyer, W., "Die Grenzen des Empfindungsvermögens, etc.," 1868, 15.